1. **Applicability**: All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2014-2015 onwards. Any reference to “College” in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

2. **Extent**: All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology (A) shall be the Chairman of the Academic Council.

3. **Admission**:

   3.1 **Admission in to first year of Four Year B.Tech., Degree Program of study in Engineering**:

   3.1.1 **Eligibility**: A candidate seeking admission into the first year of four year B.Tech., Degree Program should have Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Government of Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by the Board of Intermediate Education and JNTU Anantapur) or Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, Government of Andhra Pradesh and JNTU Anantapur) for admission.
3.1.2 **Admission Procedure**: As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech., Degree Program as follows:

Seats under various categories are filled as per the norms prescribed by the Government of Andhra Pradesh.

3.2 **Admission into the second year of four Year B.Tech., Degree Program in Engineering:**

3.2.1 **Eligibility**: Candidates qualified in ECET (FDH) and / or admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 **Admission Procedure**: Lateral Entry seats are filled as per the norms prescribed by the Government of Andhra Pradesh from time to time.

4. **Programs of study offered leading to the award of B.Tech degree**

1. B.Tech (Civil Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics & Communication Engineering)
5. B.Tech (Computer Science & Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Automobile Engineering)

5. **Academic Year**: The College shall follow semester pattern from first year onwards. I, II semesters of First Year of four Year B.Tech., Program shall have a minimum of 14 instructional weeks. From second year onwards each semester shall have a minimum of 16 instructional weeks.

6. **Course Structure**: Each Program of study shall consist of:

- **General subjects comprise of the following courses: (5 to 10%)**
  i. English Language /Communication Skills / Mind Skills
  ii. Humanities and Social Sciences
  iii. Principles of Management

The above courses are common to all Branches.
• **Basic science subjects comprise of the following courses: (15 to 25%)**
  i. Mathematics
  ii. Physics
  iii. Chemistry

The above courses are common to all branches.

• **Basic Engineering subjects comprise some of the following courses, depending upon the branch: (15 to 25%)**
  i. Engineering Drawing
  ii. Engineering workshop
  iii. Engineering Mechanics
  iv. Basic Mechanical Engineering
  v. Basic Electrical & Electronics Engineering
  vi. Computer Programming

• **Core Subjects: (45 to 55%)**

The list of professional subjects is chosen as per the suggestions of the experts to impart broad based knowledge needed in the concerned branch of study.

• **Elective subjects: (10 to 15%)**

Electives will be offered to the students to diversify the spectrum of knowledge.

These electives can also be chosen based on the interest of the student to broaden his individual skill and knowledge in the specialized area.

**Main Project:** Main Project shall be carried out in the institution / industry during IV year II semester for a period of one semester. The project report shall be submitted to the department after successful completion.

7. **Credit System**: Credits are assigned based on the following norms.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Semester Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours / Week</td>
</tr>
<tr>
<td>Theory</td>
<td>01</td>
</tr>
<tr>
<td>Practical</td>
<td>03</td>
</tr>
<tr>
<td>Drawing Practice</td>
<td>02</td>
</tr>
<tr>
<td>Project Work</td>
<td>--</td>
</tr>
</tbody>
</table>
i. As a norm, for the theory subjects, one credit for one contact period per week is assigned.

ii. As a norm, for practical courses two credits will be assigned for three contact periods per week.

iii. Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial period per week.

iv. For Project work where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

- The four year curriculum of any B.Tech, Program of study shall have a total of 176 credits.
- In the case of lateral entry students, B.Tech. program of study shall have a total of 132 credits.
- The exact requirements of credits for each subject will be as recommended by the concerned Board of Studies and approved by the Academic Council.

8. Examination System : All components in any Program of study will be Evaluated continuously through internal evaluation and an external evaluation component conducted as semester-end examination.
### 8.1 Distribution of Marks:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Examination</th>
<th>Marks %</th>
<th>Examination and Evaluation</th>
<th>Scheme of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Theory</td>
<td>70</td>
<td>Semester-end examination (external Paper setting and external evaluation)</td>
<td>This Examination question paper in theory subjects will be for a maximum of 70 marks. The question paper shall consists of two parts <strong>Part A</strong>: 5 short answer questions shall be given for a maximum 20 marks with one question from each unit. No choice will be given and all questions carry equal marks. <strong>Part B</strong>: 5 Descriptive/problematic questions shall be given for a maximum of 50 marks with one question from each unit with internal choice i.e either or type. All questions carry equal marks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mid– Examination of 120 Min. duration (Internal evaluation). The question paper shall be of descriptive type with 5 questions out of which 4 are to be answered and evaluated for 20 marks.</td>
<td>Two (02) mid-term exams, each for 20 marks are to be conducted. Better of the two shall be considered for awarding internal marks. <strong>Mid-I</strong>: After first spell of instructions(First 2 Units) <strong>Mid-II</strong>: After second spell of instructions (Last 3 Units.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>Assignment (Internal evaluation)</td>
<td>Two assignments shall be given and each will be evaluated for 10 marks. Average of two Assignments shall be taken as</td>
</tr>
</tbody>
</table>
INTERNAL MARKS FOR THE ASSIGNMENTS.

**Assignment-I:** After first spell of instructions (First 2 Units)

**Assignment-II:** After second spell of instructions (Last 3 Units.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Theory</th>
<th>Practical</th>
<th>Continuous Evaluation</th>
<th>Internal Test</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>70</td>
<td>20</td>
<td>Performance in laboratory experiments and Record are considered.</td>
<td>10</td>
<td>Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.</td>
</tr>
<tr>
<td>Drawing</td>
<td>70</td>
<td>20</td>
<td>Performance in Drawing classes will be considered.</td>
<td>10</td>
<td>Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.</td>
</tr>
<tr>
<td>Project Work</td>
<td>300</td>
<td>200</td>
<td>Semester-end Project Viva-Voce Examination by a Committee as detailed under 8.2.</td>
<td>100</td>
<td>Continuous evaluation by the Departmental Committee</td>
</tr>
</tbody>
</table>
Wherever the Question paper is different from the conventional pattern, the concerned pattern of question paper will be given at the end of the syllabus of that subject.

8.2 Project Work Evaluation: The Semester-End Examination (Viva-voce) shall be conducted by a Committee consisting of External examiner (nominated by the Chief Controller of Examinations), HOD, & Supervisor. The evaluation of project work shall be conducted at the end of the IV year second semester. The Internal Evaluation shall be made by the Departmental Committee, on the basis of two project reviews of each student.

8.3 Eligibility to appear for the Semester-End examination:

8.3.1 A student shall be eligible to appear for Semester –End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

8.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

8.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

8.3.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

8.3.5 A student detained due to shortage of attendance, will have to repeat that semester when offered next.

8.4 Evaluation: Following procedure governs the evaluation.

8.4.1 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Semester –End examinations, to arrive at total marks for any subject in that semester.

8.4.2 Performance in all the subjects is tabulated program-wise and will be scrutinized by the Results Committee and subject-wise marks lists are finalized. Total marks obtained in each subject are converted into letter grades. Results Committee comprises of Principal, Controller of Examinations, one Senior Professor nominated by the Principal and the University Nominee.

8.4.3 Student-wise tabulation is done and student-wise Grade Sheet is generated and issued to the students.

8.5 Revaluation / Recounting:

Students shall be permitted for request for recounting/revaluation of the Semester-End examination answer scripts within a stipulated period after payment of prescribed fee.
After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

8.6 Supplementary Examination:

8.6.1 In addition to the regular Semester-End examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

9. Academic Requirements for Promotion/completion of regular B.Tech Program of study:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/completion of regular B.Tech Program of study.

9.1 For students admitted in B.Tech (Regular) Program:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design drawing subject or project, if he secures not less than 35% of marks in the Semester End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 44 credits from:
   a) Two regular and two supplementary examinations of I-year I semester.
   b) Two regular and one supplementary examinations of I-year II semester.
   c) One regular and one supplementary examination of second year I semester.
   d) One regular examination of II-year II Semester.

Irrespective of whether the candidates appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 66 credits from:
   a) Three regular and three supplementary examinations of I-year I semester.
   b) Three regular and two supplementary examinations of I-year II Semester
   c) Two regular and two supplementary examination of second year I semester.
   d) Two regular and one supplementary examinations second year II semester.
   e) One regular and one supplementary examination of third year I semester.
   f) One Regular Examination of Third year II semester.
Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 9.1(ii) and 9.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 176 credits and earn all the 176 credits. Marks obtained in all the 176 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 176 credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

9.2 For Lateral Entry Students (batches admitted from 2015-2016):

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the Semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 44 credits from the following examinations.
   a) Two regular and two supplementary examinations of II year I semester.
   b) Two regular and one supplementary examination of II year II semester.
   c) One regular and one supplementary examination of III year I semester.
   d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

i. A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all 132 credits shall be considered for the award of the class based on CGPA.

ii. A student who fails to earn 132 credits as indicated in the Course structure within six academic years from the year of his admission shall forfeit his seat in B.Tech., Program and his admission stands cancelled.
9.3 **Audit Courses:** Any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

10. **Transitory Regulations:**
Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch they join later.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

11. **Grades, Grade Point Average and Cumulative Grade Point Average**

11.1 **Grade System:** After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a “**10 point scale**” described below.

<table>
<thead>
<tr>
<th>% of marks obtained</th>
<th>Grade</th>
<th>Grade Points(GP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 to 100</td>
<td>A+</td>
<td>10</td>
</tr>
<tr>
<td>80 to 89</td>
<td>A</td>
<td>9</td>
</tr>
<tr>
<td>70 to 79</td>
<td>B</td>
<td>8</td>
</tr>
<tr>
<td>60 to 69</td>
<td>C</td>
<td>7</td>
</tr>
<tr>
<td>50 to 59</td>
<td>D</td>
<td>6</td>
</tr>
<tr>
<td>40 to 49</td>
<td>E</td>
<td>5</td>
</tr>
<tr>
<td>Less than 40 in sum of Internal &amp; External (or) Less than 35 in External</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>Not Appeared</td>
<td>N</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Pass Marks:** A student is declared to have passed theory and/ or laboratory subject, if he secures minimum of 35% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade – F in such subject irrespective of internal marks.
F is considered as a fail grade indicating that the student has to pass the semester-end examination in that subject in future and obtain a grade other than F and N for clearing this subject.

11.2 Grade Point Average (GPA):
Grade Point Average (GPA) will be calculated as given below on a “10 Point scale” as an Index of the student’s performance at the end of each semester:

\[ \text{GPA} = \frac{\sum (C \times GP)}{\sum C} \]

Where C denotes the credits assigned to the subjects undertaken in that semester and GP denotes the grade points earned by the student in the respective subjects.

11.3 Cumulative Grade Point Average (CGPA):
At the end of every semester, a Cumulative Grade Point Average (CGPA) on a 10 Point scale is computed considering all the subjects passed up to that point as an index of overall Performance up to that Point as given below:

\[ \text{CGPA} = \frac{\sum (C \times GP)}{\sum C} \]

Where C denotes the credits assigned to subjects undertaken upto the end of the current year/semester and GP denotes the grade points earned by the student in the respective courses.

11.4 Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student indicating his performance in all subjects registered in that semester indicating the GPA and CGPA. GPA and CGPA will be rounded off to the second place of decimal.

12. Consolidated Grade Sheet: After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee.

13. Award of Degree: The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendation of the Principal of SVCET (Autonomous), Chittoor.

13.1 Eligibility: A student shall be eligible for the award of B.Tech., Degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
Obtained CGPA greater than or equal to 5.0 (Minimum requirement for declaring as passed.)

13.2 Award of Class: Declaration of Class is based on CGPA.

<table>
<thead>
<tr>
<th>Cumulative Grade Point Average</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥7.0</td>
<td>First Class with Distinction</td>
</tr>
<tr>
<td>≥6.0 and &lt;7.0</td>
<td>First Class</td>
</tr>
<tr>
<td>&gt;5.0 and &lt;6.0</td>
<td>Second Class</td>
</tr>
<tr>
<td>5.0</td>
<td>Pass Class</td>
</tr>
</tbody>
</table>

14. With – Holding of Results: If the candidate has not paid dues to the university/college or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

15. Additional academic regulations:
   i. A regular student has to complete all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years.
   ii. A student can appear for any number of supplementary examinations till he clears all subjects within the stipulated period.
   iii. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that semester along with the GPA and CGPA.
   iv. Any canvassing / impressing the administration, examiners, faculty or staff in any form, the candidate is liable for punishment as per the mal practice rules appended here with.
   v. When a student is absent for any examination (internal or external) he is treated as to have appeared and obtained zero marks in that component (course) and grading is done accordingly.
   vi. When a component is cancelled as a penalty, he is awarded zero marks in that component.

16. Amendments to regulations:
The Academic Council of Sri Venkateswara College of Engineering and Technology (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and/or Syllabi or any other Policy relevant to the needs of the society or industrial requirements etc., without prior notice.
17. **General:**

Where the words “he”, “him”, “his”, “himself” occur in the regulations, they include “she”, “her”, “herself”.

**Note:** Failure to read and understand the regulations is not an excuse.
# Rules for Disciplinary Action for Malpractice / Improper Conduct in Examinations

<table>
<thead>
<tr>
<th>Nature of Malpractices / Improper conduct</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If the candidate</strong></td>
<td></td>
</tr>
<tr>
<td>1. (a) Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only.</td>
</tr>
<tr>
<td>(b) Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>2. Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3.</td>
<td>Comes in a drunken condition to the examination hall.</td>
</tr>
<tr>
<td>4.</td>
<td>Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.</td>
</tr>
<tr>
<td>5.</td>
<td>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>6. Pass any lethal weapon or firearm in the examination hall.</td>
</tr>
<tr>
<td></td>
<td>7. Impersonates any other candidate in connection with the examination.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>8.</strong></td>
<td>Refuses to obey the orders of the Chief Superintendent / Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall or any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction or property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.</td>
</tr>
<tr>
<td><strong>9.</strong></td>
<td>If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10.</td>
<td>Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.</td>
</tr>
<tr>
<td>11.</td>
<td>Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.</td>
</tr>
<tr>
<td>12.</td>
<td>If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.</td>
</tr>
</tbody>
</table>

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
### I B.Tech- I Semester

<table>
<thead>
<tr>
<th>S. No</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Hours/Week</th>
<th>Credits</th>
<th>Maximum Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14AHS02</td>
<td>Engineering Mathematics-I</td>
<td>3 1 -</td>
<td>3</td>
<td>30 70 100</td>
</tr>
<tr>
<td>2</td>
<td>14AHS04</td>
<td>Engineering Physics</td>
<td>3 1 -</td>
<td>3</td>
<td>30 70 100</td>
</tr>
<tr>
<td>3</td>
<td>14AHS05</td>
<td>Environmental Science</td>
<td>3 1 -</td>
<td>3</td>
<td>30 70 100</td>
</tr>
<tr>
<td>4</td>
<td>14EE03</td>
<td>Basic Electrical Engineering</td>
<td>3 1 -</td>
<td>3</td>
<td>30 70 100</td>
</tr>
<tr>
<td>5</td>
<td>14ACS01</td>
<td>Problem Solving and Computer Programming</td>
<td>3 2 -</td>
<td>4</td>
<td>30 70 100</td>
</tr>
<tr>
<td>6</td>
<td>14AHS09</td>
<td>Engineering Physics Lab</td>
<td>- - 3</td>
<td>2</td>
<td>30 70 100</td>
</tr>
<tr>
<td>7</td>
<td>14AME03</td>
<td>Engineering Workshop</td>
<td>- - 3</td>
<td>2</td>
<td>30 70 100</td>
</tr>
<tr>
<td>8</td>
<td>14ACS03</td>
<td>Computer Programming Lab</td>
<td>- - 3</td>
<td>2</td>
<td>30 70 100</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>15 6 9</strong></td>
<td><strong>22</strong></td>
<td><strong>240 560 800</strong></td>
</tr>
</tbody>
</table>

### I B.Tech- II Semester

<table>
<thead>
<tr>
<th>S. No</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Hours/Week</th>
<th>Credits</th>
<th>Maximum Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14AHS01</td>
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### II B.Tech – II Semester

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Objective:
The objective of this course is to make students to
1. Comprehend the fundamental concepts and theoretical principles of the Economics.
2. The course equips the students to develop an economic way of thinking in dealing with practical business problems and challenges.
3. Identify the basic economic events most common in business operations.
4. Also enable the students by providing the basic knowledge of book keeping, accounting and make analysis of financial statements of a business organization.

Outcomes:
After the completion of the course student will be able to
1. Gain knowledge on managerial economics.
2. Develop an understanding of economic principles and to enhance skills in high-level problem solving and critical thinking.
3. Evaluate the economic environment and the impact of governmental economic policies on consumers and financial institutions.
4. Know the application of financial accounting in the field of Engineering.

UNIT – I
INTRODUCTION TO MANAGERIAL ECONOMICS

UNIT – II
THEORY OF PRODUCTION AND COST ANALYSIS
Production function – Cobb Douglas Production function – Laws of Returns – Internal and External economies of scale
COST ANALYSIS: Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs
BREAK EVEN ANALYSIS: Concept of Break Even Point (BEP) – Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT – III
INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:

UNIT – IV
CAPITAL AND CAPITAL BUDGETING:
Capital and its Significance – Types of capital – Estimation of fixed and working capital requirements – Methods and sources of raising capital – Capital Budgeting Methods: Payback
Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V
FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS THROUGH RATIOS:

Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt- Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

REFERENCE BOOKS:
SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester

14ACS07 COMPUTER ORGANIZATION
(Common to CSE & IT)

Objectives:
The objective of this course is to make students to
1. Understand how computers are constructed out of a set of functional units and how the functional units operate, interact, and communicate.
2. Understand the factors and trade-offs that affect computer performance. To understand the concrete Representation of data at the machine level and how computations are performed at the machine level.
3. Acquire the knowledge of computer organization and architecture (logical design) and relates this to contemporary design issues.
4. Acquire the knowledge of machine level representation of data, assembly level organization, memory system organization and architecture, system connection, memory, input/output, instruction sets, CPU structure and functions and the control Unit operation.

Outcomes:
At the end of the course the student will be able to:
1. Describe computer architecture and organization, computer arithmetic and CPU design.
2. Understand the merits and pitfalls in computer performance measurements.
4. Obtain technical knowhow of the advantage of instruction level parallelism and pipelining for high performance processor design.

UNIT I
STRUCTURE OF COMPUTERS: Computer types, functional units, basic operational concepts, Von-Neumann architecture, bus structures, software, performance, multiprocessors and multicomputer, data representation, fixed and floating point and error detecting codes.

UNIT II
REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer language, register transfer, arithmetic micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit, computer registers, computer instructions, instruction cycle, instruction formats, addressing modes, data transfer and manipulation instructions.

UNIT III
MICRO-PROGRAMMED CONTROL: Control memory, address sequencing, micro-program example, and design of control unit.
COMPUTER ARITHMETIC: Addition and subtraction, multiplication and division algorithms, floating-point arithmetic operations.

UNIT IV
THE MEMORY SYSTEM: Basic concepts, semiconductor RAM, types of read-only memory (ROM), cache memory, virtual memory, secondary storage, RAID, direct memory access.
INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Direct Memory Access, Modes of transfer, Peripheral devices.
UNIT V

PIPELINING: Basic Concepts, Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipelining, RISC pipelining, Data Hazards, Instruction hazards, Vector processing, Array processors, Characteristics of multiprocessors, interconnection structures, inter processor communication and synchronization.

TEXT BOOKS:


REFERENCE BOOKS:

Objectives:
The objective of this course is to make students to
1. Gain knowledge in new and advanced data structures in C++.
2. Be familiar with utilization of data structure techniques in problem solving.
3. Have a comprehensive knowledge of data structures and algorithm.

Outcomes:
At the end of the subject, students will be able to:
1. Understand the properties of various data structures
2. Understand basic techniques of algorithm analysis
3. Understand advanced abstract data type (ADT) and data structures and their
   Implementations,
4. Choose appropriate data structure as applied to specified problem definition.

UNIT I:
The Origins of C++, What is Object Oriented Programming, some C++ fundamentals, C++ Class
Overview-Class Definition, Objects, Class Members Access Control, Constructors and Destructors,
Inline functions, this pointer, friend functions, Exception handling.

UNIT II:
Function Overloading, Operator Over loading, Generic Programming–Function and Class
Templates, Inheritance basics, base and derived classes, inheritance types, base class access
control, runtime polymorphism using virtual functions, abstract classes.

UNIT III:
Algorithms, performance analysis - Asymptotic notations - time complexity and space complexity.
Review of basic data structures - List ADT- Linked Representation – Singly Linked List – Doubly
linked List – Applications of lists-Stack ADT – Queue ADT –Implementation using template
classes in C++.

UNIT IV:
Separate Chaining – Open Addressing – Linear Probing, quadratic probing- Priority Queues
(Heaps) – Simple implementations – Binary Heap – Heap Sort.

UNIT V:
Search trees: Binary tree traversals-Binary search trees, Definition ADT, Implementation-AVL
Trees, Implementation- Definition, Red-Black Trees and Splay Trees, B-Trees, Implementations,
Comparison of Search Trees.
Graphs: Basic concepts, Graph Representation, Graph traversal (DFS & BFS)
TEXT BOOKS:

REFERENCE BOOKS:
Objectives:
The objective of the course is to
1. Understand the fundamental concepts of digital design
2. Explain how digital circuit of large complexity can be built in a methodological way, starting from Boolean logic and applying a set of rigorous techniques.
3. Create minimal realizations of single and multiple output Boolean functions.
4. Design and analyze combinational circuits using medium scale integrated (MSI) components, including arithmetic logic units.

Outcomes:
On successful completion of this course students will be able to
1. Interpret, convert and represent different number systems and binary arithmetic.
2. Design and analyze combinational and sequential circuits for various practical problems using basic gates and flip flops.
3. Implement LSI and MSI circuits using programmable logic devices (PLDs).
4. Design different types of counters.

UNIT I
BINARY SYSTEMS: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers and Binary logic.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates and Integrated circuits.

UNIT II
GATE – LEVEL MINIMIZATION: The map method, Four-variable map, Five-Variable map, product of sums simplification, Don’t-care conditions, NAND and NOR implementation, other Two-level implementations and Exclusive-OR function.

UNIT III
COMBINATIONAL LOGIC: Combinational Circuits, Analysis procedure, Design procedure, Binary Adder and Subtractor, Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders and Multiplexers.

UNIT IV
SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure.

REGISTERS AND COUNTERS:
Shift Registers, Ripple counters, synchronous counters and Design of modulo-N Counters, Ring and Johnson Counters.

UNIT – V
MEMORIES:
Random-Access Memory, Memory Decoding, Error Detection and correction, Read-Only Memory, Programmable Logic Array(PLA), Programmable Array Logic(PAL), Sequential Programmable Devices.
TEXT BOOKS:

REFERENCE BOOKS:
Objectives:
The objective of this course is to make students to:
1. Introduce various Mathematical techniques for representation and manipulation of the data in the real world.
2. Get familiar and understand the fundamental notions in discrete mathematics.
3. Understand and demonstrate the basic concept of an algorithm and its application in combinational mathematics.
4. Identify the basic properties of graphs and trees and model simple applications.

Outcomes:
At the end of the course the student will be able to:
1. Distinguish between the notion of discrete and continuous mathematical structures.
2. Apply Propositional logic and First order logic to solve problems.
3. Understand discrete mathematical structures.
4. Formulate and solve graph problems and Count discrete event occurrences.

UNIT I
Mathematical Logic: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautology, Equivalence Implication, Normal Forms, Quantifiers, Universal Quantifiers.


UNIT II

UNIT III
Algebraic structures: Algebraic Systems- Examples and general properties, Semi groups and Monoids, Groups, Sub Groups, Cyclic Groups, Cosets, Permutation Groups, Quotient Groups, Rings and Fields, Homomorphism, Isomorphism.


UNIT IV

UNIT V
Graph Theory and Applications: Representation of Graph, DFS, BFS, Spanning Trees, Planar Graphs, Cycles, Paths and Connectedness, Vertex and Edge cuts, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers.
TEXT BOOKS:

REFERENCE BOOKS:
Objectives:
1. To understand operation of various Electronic devices such as Diodes, BJT, JFET and MOSFET.
2. To understand various applications of diode and special purpose electronic devices.
3. To understand the design of various biasing and amplifier circuits of BJT and JFET.

Outcomes:
1. Students will get working knowledge of various Semiconductor Devices like Diode, BJT, JFET, MOSFET, SCR & UJT.
2. Design and analyze the DC bias circuitry of BJT and FET.
3. Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT I
PN Junction Diode and its Applications:
PN Junction Characteristics, biasing- band diagrams and current flow, Diode current equations under forward bias and reverse bias conditions, Junction breakdown in diodes and breakdown voltages, effect of temperature on diode characteristics, Junction capacitance under forward bias and reverse bias, V-I characteristics and Specifications of Zener Diode, simple Zener voltage regulator and its limitation. Half wave, Full wave and Bridge rectifiers - their operation, performance characteristics, various filters and their importance and analysis of C-filter.

UNIT II
Bipolar Junction Transistor:
Construction, Principle of Operation, V-I characteristics, Current components and current flow in BJT, Modes of transistor operation, Early effect, BJT input and output characteristics in CB, CE CC configuration, Various BJT biasing techniques, Thermal runway and Thermal Stabilization, Stability factors, Bias stabilization and Compensation techniques.

UNIT III
Small Signal Transistors equivalent circuits: Small signal low frequency h-parameter model of BJT, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using exact h-parameters, Comparison of CB, CE and CC amplifier configurations.

UNIT IV
Junction Field Effect Transistors (JFET):
JFET Construction, Operation & Current flow, Pinch-off voltage, V-I characteristics of JFET. Various biasing circuits for JFET. Low frequency small signal model of JFET. Analysis of CS amplifier.


UNIT V
Special purpose Electronic Devices:
Principle of Operation, and Characteristics of Tunnel Diode, Varactor Diode, Schottky Barrier Diode, Silicon Control Rectifier (SCR), Uni-Junction Transistor (UJT), Semiconductor photo devices - LDR, LED, Photo diodes & Photo transistors.
**TEXT BOOKS:**

**REFERENCE BOOKS:**
Objectives:
1. To understand the working of diode, transistors and other special purpose electronics devices.
2. To understand the working of a rectifier circuit with and without filters.
3. To understand the bandwidth calculations of an amplifier circuit.

Outcomes:
At the end of the course, the student should be able to:
1. Analyze CE, CB and CS amplifiers and its bandwidth calculation.
2. Calculate various parameters from the characteristics of various electronic devices.
3. Know the importance of Filters and its calculations.

Electronic Workshop Practice:
1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JFETs, LEDs, LCDs, SCR, UJT.
3. Soldering Practice- Simple circuits using active and passive components.
4. Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital Multimeter, Function Generator, Regulated Power Supply and CRO.

List of Experiments
(For Laboratory Examination-Minimum of Twelve Experiments)

1. Study of CRO Operation and its Applications.
2. P-N Junction Diode Characteristics
   Part A: Germanium Diode (Forward bias& Reverse bias)
   Part B: Silicon Diode (Forward bias only)
3. Zener Diode Characteristics
   Part A: V-I Characteristics
   Part B: Zener Diode act as a Voltage Regulator
4. Rectifiers (without and with c-filter)
   Part A: Half-wave Rectifier
   Part B: Full-wave Rectifier
5. BJT Characteristics (CE Configuration)
   Part A: Input Characteristics
   Part B: Output Characteristics
6. BJT Characteristics (CB Configuration)
   Part A: Input Characteristics
   Part B: Output Characteristics
7. FET Characteristics (CS Configuration)
   Part A: Drain (Output) Characteristics
   Part B: Transfer Characteristics

8. SCR Characteristics.

9. UJT Characteristics.

10. LDR Characteristics.

11. LED Characteristics.

12. Transistor Biasing.


**Equipment required for Laboratory:**

1. Regulated Power Supplies.
4. Digital Multimeter.
6. Decade Capacitance Boxes.
7. Ammeters (Analog or Digital).
8. Voltmeters (Analog or Digital).
12. CRO Probes etc.
Week 1
   a) Given that an Employee class contains following members: Data members: Employee number, Employee name, Basic, DA, IT, Net salary and print data members. Write a c++ program to read the data of N employees and compute net salary of each employee (DA=52% of Basic and Income Tax(IT)=30% of the gross salary).
   b) Define a STUDENT class with USN, Name and Marks in 3 tests of subjects. Declare an array of 10 student’s objects. Using appropriate functions print USN, Name and the average of marks of the all students.

Week 2
   a) Write a C++ program illustrating Constructor overloading(Both parameterized and default).
   b) Write a C++ program illustrating Inheritance (Multiple, Multilevel Hybrid).

Week 3- Write C++ programs to implement the following using an array.
   a) Stack ADT     b) Queue ADT

Week 4- Write C++ programs to implement the following using a singly linked list.
   a) Stack ADT     b) Queue ADT

Week 5- Write C++ programs to implement the dequeue (double ended queue) ADT Using a doubly linked list and an array.

Week 6- Write C++ programs for implementing the following sorting methods:
   a) Merge sort     b) Heap sort

Week 7- Write C++ programs that use non-recursive functions to traverse the given binary tree
   a) Preorder     b) In order and c) Post order

Week 8- Write C++ program to perform the following operations
   a) Insert an element into a binary search tree.
      b) Delete an element from a binary search tree.
      c) Search for a key element in a binary search tree.

Week 9- Write C++ program to perform the following operations
   a) Insertion into a B-Tree     b) Deletion from B-Tree

Week 10- Write C++ program to perform the following operations
         a) Insertion into an AVL-tree b) Deletion from an AVL-tree

Week 11- Write C++ program to implement all the functions of a Dictionary (ADT) using Hashing.

Week 12- Write C++ programs for the implementation of bfs and dfs for a given graph.
SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II  B.Tech II Semester CSE
14AHS10  PROBABILITY AND STATISTICS
(Common to CSE, IT & AUT)

Objectives:
The objective of this course is to make students to
1. To revise elementary concepts and techniques
2. To formalize the knowledge of theory of probability, random variables, probability distributions and different
   techniques of statistical methodologies.
3. To know the different estimations and hypothesis concerning proportions.
4. To apply the above concepts to data analysis.

Outcomes:
After completion of the course the student will be able to
1. The student is able to sample the data and analyse it.
2. Able to optimize a function with two or more variables.
3. Student is able to apply suitable tests and evaluate the acceptance of the hypothesis.
4. The student is able to apply different estimations and hypothesis to solve the problems

UNIT-I
PROBABILITY AND RANDOM VARIABLES: Sample space and events – Probability - The axioms of
probability – Addition theorem of Probability – Conditional probability – Baye’s theorem. Discrete
and Continuous random variables – Mean and Variance.

UNIT-II:
DISTRIBUTIONS AND SAMPLING THEORY: Distribution Functions – Binomial, Poisson and
Normal Distributions.
SAMPLING DISTRIBUTIONS Populations and Samples – Sampling distributions of mean.

UNIT-III
ESTIMATION & TESTING OF HYPOTHESIS
Populations and Samples – Point Estimation – Interval estimation – Bayesian estimation.
Type I error and Type II errors, One tail, two tail tests - Hypothesis concerning one and two
means Hypothesis concerning one and two proportions.

UNIT-IV
TESTING OF SIGNIFICANCE (SMALL SAMPLES)
Student- t-test, F-test, Chi-square \([x^2]\) test: \(x^2\) test goodness of fit – the analysis of RxC tables,
ANOVA – I way and II way classification.

UNIT-V
QUALITY CONTROL & QUEUEING THEORY: Introduction to Quality Control, Construction of \(\bar{X}\),
Range chart, C chart and P charts. Pure Birth and Death process- M/M/1 Model – Problems on
M/M/1 Model.

Text Books:
1. Iyengar. T.K.V., Krishna Gandhi B., Probability & Statistics, New Delhi, S.Chand &
   Publications, New Delhi.
Reference Books:
Objectives:
The objective of this course is to make students to
1. Develop an understanding of basic operating system concepts.
2. Gain an understanding of how an operating system manages concurrency.
3. Design and solve synchronization problems
4. Develop a knowledge of modern operating system practice

Outcomes:
At the end of the course Students will be able to
1. Understand basic operating system concepts: computer and operating system structures, process Management, storage Management, protection.
2. Understand the fundamental elements of thread and process concurrency.
3. Solve the deadlock problems that are faced by operating system during the execution.
4. Relate modern industrial-strength operating system design and implementation to general operating system concepts

UNIT I
Introduction:

UNIT II
Process Management

UNIT III
Memory Management
Background, Swapping, Contiguous Memory Allocation, Paging, Structure of the Page table, Segmentation.
Virtual Memory Management
Background, Demand paging, Page Replacement, Allocation of Frames, Thrashing.

UNIT IV
Storage Management:
UNIT V
Deadlocks
System Models, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance –Bankers Algorithm, Deadlock Detection, Recovery from Deadlock.

Protection and Security

TEXT BOOK:

REFERENCE BOOKS:
Objectives:
The objectives of this course are as follows:
1. To provide students an in-depth theoretical base of the object oriented programming using JAVA.
2. To introduce the students to the programming statements of Java to manage execution flow control.
3. To provide knowledge about the benefits of object oriented programming over Procedure oriented programming.
4. To inculcate knowledge to students to use various concepts like Inheritance, file access techniques, polymorphism and memory management techniques.

Outcomes:
Successful completion of this course, students should be able to:
1. Understand the concept and underlying principles of Object-Oriented Programming.
2. Understand how object-oriented concepts are incorporated into the Java programming language.
3. Develop problem-solving and programming skills using OOP concept.
4. Develop the ability to solve real-world problems through software development in high-level programming language like Java.

UNIT I
OBJECT ORIENTED CONCEPTS: OOP principles-Encapsulation, Inheritance and Polymorphism, Class fundamentals, declaring objects, introducing methods, usage of static with data and methods.

JAVA BASICS: History of Java, Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, string and String Buffer handling functions.

UNIT II
INHERITANCE AND POLYMORPHISM: Basic concepts, types of inheritance, member access rules, usage of this and super key word, method overloading, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, Garbage Collection.
PACKAGES AND INTERFACES: Defining package, access protection, importing packages, defining and implementing interface, and variables in interface and extending interfaces.

UNIT III
EXCEPTION HANDLING: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.
MULTI THREADING: Concepts of thread, thread life cycle, creating threads using thread class and runnable interface, synchronization, thread priorities, inter thread communication.

UNIT IV
AWT CONTROLS: The AWT class hierarchy, user interface components- labels, button, text components, check box, check box groups, choices, list box, panels - scroll pane, menu, scrollbars. Working with frame windows, color, font.
EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes.
UNIT V
SWINGS: Introduction to swings, hierarchy of swing components. Containers, top level containers - JFrame, JWindow, JDialog- JPanel, swing components - JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPane, JScrollPane.
APPLETS: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets.

TEXT BOOK:

REFERENCE BOOKS:
Objectives:

The objective of this course is to make students to:

1. Introduce various Mathematical techniques for representation and manipulation of the data in the real world.
2. Expose students to a variety of technique for designing and analyzing algorithms
3. Understand how the worst-case time complexity of an algorithm is defined.
4. Formulate the time order analysis for an algorithm to prove the correctness of an algorithm

Learning Outcomes:

At the end of the course the student will be able to:

1. Analyze time and space complexity
2. Identify algorithm design methodology to solve problems.
3. Design algorithms for network flows
4. Distinguish between P and NP classes of problems

UNIT I

Introduction: Algorithm, Psuedo code for expressing algorithms, Performance Analysis—Space complexity, Time complexity, Asymptotic Notation—Big oh notation, Omega notation, Theta notation and Little oh notation.

Divide and conquer: General method, applications—Binary search, Quick sort, Merge sort, Strassen’s matrix multiplication.

UNIT II

Greedy method: General method, applications—Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III

Dynamic Programming: General method, applications—Matrix chain multiplication, 0/1 knapsack problem, All pairs shortest path problem, Travelling salesperson problem, Reliability design.

UNIT IV

Graph Searching and Traversal: Overview, Traversal methods (depth first and breadth first search), Applications of DFS—connected components, Bi-connected components.

Backtracking: General method, applications—n-queen problem, graph coloring, Hamiltonian cycles.

UNIT V

Branch and Bound: General method, applications—Travelling salesperson problem, 0/1 knapsack problem—LC Branch and Bound solution, FIFO Branch and Bound solution.

NP-Hard and NP-Complete problems: Basic concepts, non-deterministic algorithms, NP - Hard and NP Complete classes.
TEXT BOOK:

REFERENCE BOOKS:
Objectives:
The objective of this course is to make students to:
1. Classify machines by their power to recognize languages.
2. Employ finite state machines to solve problems in computing.
3. Explain deterministic and non-deterministic machines.
4. Comprehend the hierarchy of problems arising in the computer sciences.

Outcomes:
At the end of the course the student will be able to:
1. Understand formal machines, languages and computations.
2. Design finite state machines for acceptance of strings.
3. Design context free grammars for formal languages.
4. Develop pushdown automata accepting strings.

UNIT I

UNIT II
Regular Expressions: The Operators of Regular Expressions, Building Regular Expressions, Precedence of Regular Expression Operators, Finite Automata and Regular Expressions, Converting DFA's to Regular Expressions by Eliminating States, Converting Regular Expressions to Automata, Applications of Regular Expressions, Algebraic Laws for Regular Expressions.

UNIT III

UNIT IV
Push Down Automata: Push Down Automata, Definition, Model, A Graphical Notation for PDA's, Instantaneous Descriptions of a PDA, The Languages of a PDA, Acceptance of CFL by Final State and Acceptance by Empty State and their Equivalence. Equivalence of CFL and PDA, Introduction to DCFL and DPDA.
Turing Machine: Turing Machine, Definition, Model, Design of TM, Computable Functions, Notation for the Turing Machine, Instantaneous Descriptions for the Turing Machines, Transition Diagrams for Turing Machines, The Language of a Turing Machine, Recursively Enumerable Languages, Church’s hypothesis, Types of Turing Machines (Proofs not required).
UNIT V

Computability Theory: Chomsky Hierarchy of Languages, Linear Bounded Automata and Context Sensitive Language, LR(0) grammar, An Undecidable Problem That is RE, Complements of Recursive and Recursively Enumerable Languages, Turing Reducibility, The Universal Language, Undecidability of the Universal Language.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
The objective of this course is to make students to:
1. Understand the importance of DBMS and explain how DBMS is better than traditional File Processing Systems and analyze the basic structure of Database and recognize the different views of the database.
2. Draw and Investigate Data Flow and Entity Relationship Diagrams. & analyze and use Relational Data Model, while comparing with other data models.
3. Formulate data retrieval queries in SQL and the Relational Algebra and Calculus. & Describe the semantics of a SQL query in set-theoretic terms.
4. Understand terms like Deadlocks, Transaction Processing and Concurrency Control.

OUTCOMES:
At the end of the course the student will be able to:
1. Understand functional components of the DBMS.
2. Acquire Capability of maintenance of huge amounts of data along with reducing of redundancy in data.
3. Design data base schema, Develop E-R Model, Evaluate and optimize queries.
4. Understand transaction processing, concurrency control and recovery techniques.

UNIT I
INTRODUCTION: History of database systems- Database system applications - Database system vs file systems - Purpose of Database System – Describing and storing data in a DBMS- Structure of a DBMS.
ENTITY-RELATIONSHIP MODEL (E-R MODEL): E-R Diagrams-Features of ER Model-conceptual Database design with the ER model-conceptual design for large enterprises.

UNIT II
RELATIONAL MODEL: Introduction to relational model - Integrity constraints -Querying relational data-Logical Database design- Introduction to views- Destroying/Altering Tables and views- Relational Algebra - Relational Calculus.
SQL: The form of a basic SQL query-Union, Intersect and Except operators-Nested queries- Aggregate operators-Null values-Complex integrity constraints in SQL-Triggers and active databases-Designing active databases- Embedded SQL-Triggers – Cursors- Procedures-Functions in PL/SQL.

UNIT III
SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement-Functional Dependencies – reasoning about FDs-Normal Forms: 1NF,2NF,3NF,Boyce-Codd Normal Form- Properties of decompositions-Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT IV
CONCURRENCY: Concurrency control: Lock based protocols- Time stamp based protocols- Validation based protocols-Multiple granularity-Deadlock handling.

UNIT V
INDEXING AND HASHING: Ordered Indices- B+ Tree Index Files- B- Tree Index Files-Multiple Key Access- Static Hashing- Dynamic Hashing- Comparison of Ordered Indexing and Hashing- Bitmap Indices.

TEXT BOOKS:

REFERENCE BOOKS:
Objectives:
The objective of this course is to make students to:
1. Understand object oriented programming concepts - java as an object oriented programming language.
2. Effectively use the Java SDK environment to create, debug and run simple Java programs.
3. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class.
4. Understand fundamental concepts of Swings & AWT.

Outcomes:
After completion of this course, the students would be able to
1. Implement Java classes from specifications and effectively create and use objects from predefined class libraries
2. Understand the behavior of primitive data types, object references, and arrays
3. Apply decision and iteration control structures to implement algorithms and Write simple recursive algorithms
4. Implement interfaces, inheritance, and polymorphism as programming techniques, apply Exception Handling

Week 1:
a) Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0.
Read in a, b, c and use the quadratic formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions.
b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it.
c) Write a Java program that uses both recursive and non-recursive functions to print the nth value in the Fibonacci sequence.

Week 2:
a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
b) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)

Week 3:
a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
b) Write a Java program for sorting a given list of names in ascending order.
c) Write a Java program to make frequency count of words in a given text.

Week 4:
a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
c) Write a Java program that displays the number of characters, lines and words in a text file.
Week 5:
a) Write a Java program that:
ii) Converts infix expression into Postfix form
iii) Evaluates the postfix expression

Week 6:
a) Develop an applet that displays a simple message
b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named —Compute‖ is clicked.

Week 7:
Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

Week 8:
a) Write a Java program for handling mouse events.

Week 9:
a) Write a Java program that creates three threads. First thread displays —Good Morning‖ every one second, the second thread displays —Hello‖ every two seconds and the third thread displays —Welcome‖ every three seconds.
b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Week 10:
Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box.

Week 11:
Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

Week 12:
a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on, and only one light can be on at a time. No light is on when the program starts.
b) Write a Java program that allows the user to draw lines, rectangles and ovals.

Week 13:
a) Write a java program to create an abstract class named Shape that contains an empty method named number of Sides (). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains.

Week 14:
a) Write a java program to check the compatibility for multiplication, if compatible multiply two matrices and find its transpose.
b) Write a java program that lets users create Pie charts. Design your own own user interface (with Swings & AWT).
The objective of this course is to make students to:
1. To Understand, appreciate and effectively explain the underlying concepts of database technologies
2. Design and implement a database schema for a given problem-domain.
3. Populate and query a database using SQL DML/DDL commands.
4. To Understand the concepts of Triggers

At the end of the course the student will be able to:
1. Create, Modify, and manipulate the data database objects.
2. Retrieving the data from the database server.
3. Performing database operations in a procedural manner using pl/sql
4. Develop Programs using BEFORE and AFTER Triggers.

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION,INTER SET, Constraints. Example:- Select the roll number and name of the student who secured fourth rank in the class.
3. Using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions.
8. Program development using a creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using the creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.
Objectives:

The main objectives of this course are:

1. To learn the concepts of coding and decoding of letters and numbers.
2. To interpret data using the graphs.
3. To understand the basic concepts of probability.
4. To Comprehend the relation between time and distance in real life problems.

Outcomes:

After completion of the course the student will be able to:

1. Strengthen their ability to meet the challenges in solving Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Pie graphs.
3. Develop the thinking ability and apply Venn diagram and binary logic.
4. Apply the number series and letter analogies in problems on verbal analogy.

Syllabus for Quantitative Aptitude

Competency 1:

1.1 Numbers
- Classification of numbers
- Divisibility rules
- Finding the units digit
- Finding remainders in divisions involving higher powers
- LCM and HCF Models.

1.2 Decimal Fractions

1.3 Simplification

1.4 Square Roots & Cube Roots

1.5 Average
- Definition of Average
- Rules of Average
- Problems on Average
- Problems on Weighted Average
- Finding Average using assumed mean method.

1.6 Problems on Numbers
1.7 Problems on Ages
1.8 Surds & Indices
1.9 **Percentage**
Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on Percentages

1.10 **Profit And Loss & True Discount**
Problems on Profit and Loss percentage - Relation between Cost Price and Selling price - Discount and Marked Price - Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling.

1.11 **Ratio and proportion**
Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and Continued Proportion.

**Competency 2:**

2.1 **Partnership**
Introduction - Relation between capitals, Period of Investments and Shares.

2.2 **Chain Rule**

2.3 **Time & work**
Problems on Unitary method - Relation between Men, Days, Hours and Work - Problems on Man-Day-Hours method – Problems on alternate days - Problems on Pipes and Cisterns.

2.4 **Time & Distance**
Relation between speed, distance and time – Converting kmph into m/s and vice versa - Problems on average speed - Problems on relative speed – Problems on trains - Problems on boats and streams - Problems on circular tracks – Problems on races.

2.5 **Mixtures and Allegations**
Problems on mixtures - Allegation rule - Problems on Allegation

2.6 **Simple Interest**
Definitions - Problems on interest and amount – Problems when rate of interest and time period are numerically equal.

2.7 **Compound Interest**
Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

2.8 **Logarithms**
Syllabus for Reasoning

Competency 3:

3.1 Cubes
Basics of a cube - Formulae for finding volume and surface area of a cube - Finding the minimum number of cuts when the number of identical pieces are given - Finding the maximum number of pieces when cuts are given - Problems on painted cubes of same and different colors - Problems on cuboids - Problems on painted cuboids - Problems on diagonal cuts

3.2 Venn diagrams
Representing the given data in the form of a Venn diagram – Problems on Venn diagrams with two sets - Problems on Venn diagrams with three sets – Problems on Venn diagrams with four sets

3.3 Binary Logic
Definition of a truth-teller - Definition of a liar - Definition of an alternator – Solving problems using method of assumptions - Solving analytical puzzles using binary logic .

Competency 4:

a. Number and letter series
Difference series - Product series - Squares series - Cubes series - Alternate series - Combination series - Miscellaneous series - Place values of letters.

b. Number and Letter Analogies
Definition of Analogy - Problems on number analogy - Problems on letter analogy - Problems on verbal analogy .

Odd man out
Problems on number Odd man out - Problems on letter Odd man out – Problems on verbal Odd man out .

Competency 5:

5.1 Coding and decoding
Coding using same set of letters - Coding using different set of letters – Coding into a number - Problems on R-model .

5.2 Direction sense
Solving problems by drawing the paths-Finding the net distance travelled – Finding the direction - Problems on clocks - Problems on shadows - Problems on damaged compass - Problems on direction sense using symbols and notations

5.3 Critical Reasoning
Problems on assumption – Problems on conclusions – Problems on inferences – Problems on strengthening and weakening of arguments – Problems on principle – Problems on paradox

5.4 Lateral reasoning puzzle

Text Books:


Reference Books: